

DATE: 11/10/2009

INVITATION TO BID  
THIS IS NOT AN ORDER

Page: 1

BID NO.: 50-00096105  
SOLICITATION #B2009000274

**JEFFERSON PARISH**  
PURCHASING DEPARTMENT  
P.O. BOX 9  
GRETNA, LA. 70054-0009  
504-364-2678

VENDOR:

BUYER: S. Vasquez

**BIDS WILL BE RECEIVED IN THE PURCHASING DEPARTMENT, SUITE 4400, JEFFERSON PARISH GENERAL GOVERNMENT BUILDING, 200 DERBIGNY STREET, GRETNA, LA 70053 UNTIL 2:00 PM, 12/01/2009 AND PUBLICLY OPENED UPON COMPLETION OF ADMINISTRATIVE TASKS.**

**LATE BIDS WILL NOT BE ACCEPTED**

**NOTE: ONLY BIDS WRITTEN IN INK OR TYPEWRITTEN, AND PROPERLY SIGNED BY A MEMBER OF THE FIRM OR AUTHORIZED REPRESENTATIVE, WILL BE ACCEPTED. PENCIL AND/OR PHOTOSTATIC FIGURES OR SIGNATURES DISQUALIFY BID.**

**INSTRUCTIONS FOR BIDDERS AND GENERAL CONDITIONS**  
**THE FOLLOWING INSTRUCTIONS APPLY TO ALL BIDS**

All bids submitted are subject to these instructions and general conditions and any special conditions and specifications contained herein, all of which are made part of this bid proposal reference. THIS BID PACKAGE MUST BE RETURNED IN ITS ENTIRETY.

Questions on this bid are to be faxed to (504) 364-2693 no later than FIVE (5) working days prior to bid opening. Bid numbers should be mentioned in all requests.

The purpose and intention of this invitation to bid is to afford all suppliers an equal opportunity to bid on all construction, maintenance, repair, operating supplies and/or equipment listed in this bid proposal. JEFFERSON PARISH will accept one bid only from each vendor. Items bid must meet or exceed specifications.

JEFFERSON PARISH will accept one price for each item unless otherwise indicated. Two or more prices for one item will result in bid rejection.

If the bid exceeds \$20,000.00 and the bidder is an agency, corporation, partnership, or other legal entity, the president, vice-president, secretary/treasurer, or an authorized agent, shall sign the proposal, and satisfactory evidence of the authority of the person signing for the agency, corporation, partnership, or other legal entity shall be attached to the proposal.

**AWARD OF CONTRACT:** JEFFERSON PARISH reserves the right to award contracts or place orders on a lump sum or individual item basis, or such combination, as shall in its judgment be in the best interest of JEFFERSON PARISH. Every contract or order shall be awarded to the LOWEST RESPONSIBLE BIDDER, taking into consideration the CONFORMITY WITH THE SPECIFICATIONS and the DELIVERY AND/OR COMPLETION DATE.

Preference is hereby given to materials, supplies, and provisions produced, manufactured or grown in Louisiana, quality being equal to articles offered by competitors outside the state. "LSA-R.S.38:2251-2261"

**USE OF BRAND NAMES AND STOCK NUMBERS:** Where brand names and stock numbers are specified, it is for the purpose of establishing certain minimum standards of quality. Bids may be submitted for products of equal quality, provided brand names and stock numbers are specified. Complete product data may be required prior to award.

**CANCELLATION OF CONTRACT:** JEFFERSON PARISH reserves the right to cancel all or any part if not shipped promptly. No charges will be allowed for parking or cartage unless specified in quotation. The order must not be filled at a higher price than quoted. JEFFERSON PARISH reserves the right to cancel any contract at anytime and for any reason by issuing a THIRTY (30) day written notice to the contractor.

For good cause and as consideration for executing a contract with Jefferson Parish, vendor conveys, sells, assigns and transfers to Jefferson Parish or its assigns all rights, title and interest in and to all causes of action it may now or hereafter acquire under the antitrust laws of the United States and the State of Louisiana, relating to the particular good or services purchased or acquired by Jefferson Parish.

Visit our website at [WWW.JEFFPARISH.NET/BIDS](http://WWW.JEFFPARISH.NET/BIDS)

**INSTRUCTIONS FOR BIDDERS AND GENERAL CONDITIONS**

JEFFERSON PARISH requires a firm price. Quoted price will remain firm until \_\_\_\_\_

**PRICES:** Jefferson Parish is exempt from paying sales tax under LSA-RS 47:301 (8)(c). All prices for purchases by Jefferson Parish of supplies and materials shall be quoted in the unit measure specified and unless otherwise specified, shall be exclusive of state and Parish taxes. If a contractor is to act as Purchasing Agent for tax-exempt purposes, the Parish shall specifically state so within this bid specification. All quotations shall be based on F.O.B. Agency warehouse or job site, anywhere within the Parish as designated by the Purchasing Department.

Quantities listed are for bidding purposes only. Actual requirements may be more or less than quantities listed.

Bidders are not to exclude from participation in, deny the benefits of, or subject to discrimination under any program or activity, any person in the United States on the grounds of race, color, national origin, or sex; nor discriminate on the basis of age under the Age Discrimination Act of 1975, or with respect to an otherwise qualified handicapped individual as provided in Section 504 of the Rehabilitation Act of 1973, or on the basis of religion, except that any exemption from such prohibition against discrimination on the basis of religion as provided in the Civil Rights Act of 1964, or Title VI and VII of the Act of April 11, 1968, shall also apply. This assurance includes compliance with the administrative requirements of the Revenue Sharing final handicapped discrimination provisions contained in Section 51.55 (c), (d), (e), and (k)(5) of the Regulations. New construction or renovation projects must comply with Section 504 of the 1973 Rehabilitation Act, as amended, in accordance with the American National Standard Institute's specifications (ANSI A117.1-1961).

**RESPONSE TO INVITATION:** If your company is unable to bid on this request, please state your reason on bid form, and return to this office before bid opening date. Failure to do so may result in the removal of your company from Jefferson Parish's vendors list.

The general specifications for construction projects and the purchase of materials, services and/or supplies are those adopted by the JEFFERSON PARISH Council by Resolution No. 105529 or 105530 dated 5/17/06. The general conditions adopted by this resolution shall be considered as much a part of this document as if they were written wholly herein. A copy may be obtained from the Office of the Parish Clerk, Suite 6700, Jefferson Parish General Government Building, 200 Derbigny Street, Gretna, LA 70053.

**POSTING OF BIDS:** Non-Advertised bids will be posted on bulletin board in Suite 4400, Jefferson Parish General Government Building, Gretna, LA, for a period of Five (5) working days after opening date.

Advertised bids will be tabulated and a copy forwarded to each responsive bidder.

**ADDITIONAL REQUIREMENTS FOR THIS BID**

PLEASE MATCH THE NUMBERS PRINTED IN THIS BOX WITH THE CORRESPONDING INSTRUCTIONS BELOW.  
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1. All bidders are invited to attend the pre-bid conference. Failure to attend the pre-bid conference shall not relieve the bidder of responsibility for information discussed at the conference. This conference is held to allow questions to be answered and inspect the site with owner's representative, etc. Failure to attend the pre-bid conference and inspection does not relieve the successful bidder from the necessity of furnishing materials or performing any work that may be required to complete the work in accordance with the specification (with no additional cost to the owner).
2. Contractor must hold current applicable JEFFERSON PARISH licenses with the Department of Inspection and Code Enforcement. Contractor shall obtain any and all permits required by the JEFFERSON PARISH Department of Inspection and Code Enforcement. The contractor shall be responsible for the payment of these permits. All permits must be obtained prior to the start of the project.
3. A Louisiana state contractor's license may be required in accordance with LSA-R.S. 37:2150 et seq.

**INSTRUCTIONS FOR BIDDERS AND GENERAL CONDITIONS**

- 4. It is the bidder's responsibility to visit the job site and evaluate the job before submitting a bid.
- 5. Job site must be clean and free of all litter and debris daily and upon completion of the contract. Passageways must be kept clean and free of material, equipment, and debris at all times. Flammable material must be removed from the job site daily because storage will not be permitted on the premises. Precautions must be exercised at all times to safeguard the welfare of JEFFERSON PARISH and the general public.
- 6. All awards in excess of \$5,000.00 for the construction, alteration, or repair of any public works will be reduced to a formal contract which shall be recorded at the contractor's expense. A price list of recordation costs may be obtained from the Clerk of Court and Ex-officio Recorder of Mortgages for the Parish of Jefferson. All awards in excess of \$25,000.00 reduced to formal contract will require a performance bond.
- 7. A performance bond will be required for this bid. The amount of the bond will be 100% of the contract price unless otherwise indicated in the specifications. Performance bond shall be supplied at the signing of the contract.
- 8. Please indicate if you have insurance: YES \_\_\_\_\_ NO \_\_\_\_\_  
Successful bidder will be required to furnish proof of insurance to this office.  
Successful bidder will be required to furnish Federal I.D. Number.
- 9. Minimum insurance requirements for this bid are as indicated on the attached sheet.
- 10. Each bid must be accompanied by a cashier's check, certified check, money order, or surety bid bond in the amount of 5% of the bid.
- 11. Affidavit required to be submitted with bids on all solicitations for construction, alteration or demolition of public building or project. (LSA-R.S. 38:2224)
- 12. This is a requirements contract to be provided on an as needed basis.
- 13. All prices must be held firm unless an escalation provision is requested in this bid. Jefferson Parish will allow one escalation during the term of the contract, which may not exceed the U.S. Bureau of Labor Statistics National Index for all Urban Consumers, unadjusted 12 month figure. The most recently published figure issued at the time an adjustment is requested will be used. A request must be made in writing by the vendor, and the escalation will only be applied to purchases made after the request is made.

Are you requesting an escalation provision?

YES \_\_\_\_\_ NO \_\_\_\_\_

MAXIMUM ESCALATION PERCENTAGE REQUESTED \_\_\_\_\_%

INITIAL BID PRICES WILL REMAIN FIRM THROUGH THE DATE OF \_\_\_\_\_.

For the purposes of comparison of bids when an escalation provision is requested, Jefferson Parish will apply the maximum escalation percentage quoted by the bidder to the period to which it is applied in the bid. The initial price and the escalation will be used to calculate the total bid price. It will be assumed, for comparison of prices only, that an equal amount of material or labor is purchased each month throughout the entire contract.

- 14. In the event that the successful bidder cannot furnish a specific item or material and labor in the required time, JEFFERSON PARISH may purchase on an emergency basis from the next lowest bidder, or available source, until such time as the successful bidder has notified the PARISH in writing that his stock or labor capability has been replenished. The difference in price will be charged against the successful bidder of this contract, and evidence of purchases and price will be provided.
- 15. Vendor will be required to submit to the chief buyer of the JEFFERSON PARISH Purchasing Department a quarterly usage report by item of all items listed on this proposal.
- 16. Freight charges should be included in total cost when quoting. If not quoted FOB DELIVERED, freight must be quoted as a separate item. Bid may be disqualified if not quoted FOB DELIVERED or if freight charges are not indicated on bid form.

INSTRUCTIONS FOR BIDDERS AND GENERAL CONDITIONS

<b>DELIVERY: FOB JEFFERSON PARISH</b>	
INDICATE DELIVERY DATE ON EQUIPMENT AND SUPPLIES	_____
INDICATE STARTING TIME (IN DAYS) FOR CONSTRUCTION WORK	_____
INDICATE COMPLETION TIME (IN DAYS) FOR CONSTRUCTION WORK	_____

LOUISIANA CONTRACTOR'S LICENSE NO.: (if applicable) \_\_\_\_\_

<b>*** ALL BIDDERS MUST COMPLETE SECTION BELOW ***</b>	
FIRM NAME:	
SIGNATURE: (Must be signed here)	TITLE:
PRINT OR TYPE NAME:	
ADDRESS:	
CITY, STATE:	ZIP:
TELEPHONE: ( )	FAX: ( )
EMAIL ADDRESS:	

TOTAL PRICE OF ALL BID ITEMS: \$ \_\_\_\_\_

<p><b>THIS BID MUST BE SIGNED BY AN AUTHORIZED REPRESENTATIVE OF THE COMPANY/FIRM FOR BID TO BE VALID. BID PACKAGE, INCLUDING INSTRUCTIONS AND SPECIFICATIONS, MUST BE RETURNED IN ITS ENTIRETY FOR BID TO BE VALID. SIGNING INDICATES YOU HAVE READ AND COMPLY WITH THE INSTRUCTIONS AND CONDITIONS.</b></p>
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**NOTE:** All bids should be returned with the bid number and bid opening date indicated on the outside of the envelope submitted to the Purchasing Department.

INVITATION TO BID FROM JEFFERSON PARISH - continued

BID NO.: 50-00096105

SEALED BID

ITEM NUMBER	QUANTITY	U/M	DESCRIPTION OF ARTICLES	UNIT PRICE QUOTED	TOTALS
1	3	EA	<p>PURCHASE OF A QUANTITY OF SUBMERSIBLE PUMPS, DISCHARGE ELBOWS, RAIL SYSTEM AND NEW PUMP HATCHES FOR JEFFERSON PARISH DEPARTMENT OF PUBLIC WORKS, SEWERAGE</p> <p>0010 - A quantity of Submersible Pumps, discharge elbows, rail system and new pump hatches as per attached specifications.</p> <p>Furnish three (3) new submersible pumps and appurtenances complete including but not limited to (3) heavy duty, wastewater pumps, motors, hatch covers, base elbows, guide rails, and other auxiliary equipment and materials as specified herein and as required.</p> <p>PLEASE NOTE: UNITS MUST BOLT INTO EXISTING PIPING WITH NO MODIFICATIONS</p> <p>SEE ATTACHED SPECIFICATIONS</p>		

**CORPORATE RESOLUTION**

EXCERPT FROM MINUTES OF MEETING OF THE BOARD OF DIRECTORS OF  
\_\_\_\_\_  
INCORPORATED.

AT THE MEETING OF DIRECTORS OF \_\_\_\_\_  
INCORPORATED, DULY NOTICED AND HELD ON \_\_\_\_\_,  
A QUORUM BEING THERE PRESENT, ON MOTION DULY MADE AND SECONDED. IT  
WAS:

RESOLVED. THAT \_\_\_\_\_, BE AND IS HEREBY  
APPOINTED, CONSTITUTED AND DESIGNATED AS AGENT AND ATTORNEY-IN-  
FACT OF THE CORPORATION WITH FULL POWER AND AUTHORITY TO ACT ON  
BEHALF OF THIS CORPORATION IN ALL NEGOTIATIONS, BIDDING, CONCERNS  
AND TRANSACTIONS WITH THE PARISH OF JEFFERSON OR ANY OF ITS AGENCIES,  
DEPARTMENTS, EMPLOYEES OR AGENTS, INCLUDING BUT NOT LIMITED TO, THE  
EXECUTION OF ALL BIDS, PAPERS, DOCUMENTS, AFFIDAVITS, BONDS, SURETIES,  
CONTRACTS AND ACTS AND TO RECEIVE AND RECEIPT THEREFOR ALL  
PURCHASE ORDERS AND NOTICES ISSUED PURSUANT TO THE PROVISIONS OF  
ANY SUCH BID OR CONTRACT, THIS CORPORATION HEREBY RATIFYING,  
APPROVING, CONFIRMING, AND ACCEPTING EACH AND EVERY SUCH ACT  
PERFORMED BY SAID AGENT AND ATTORNEY-IN-FACT.

I HEREBY CERTIFY THE FOREGOING TO BE  
A TRUE AND CORRECT COPY OF AN  
EXCERPT OF THE MINUTES OF THE  
ABOVE DATED MEETING OF THE BOARD  
OF DIRECTORS OF SAID CORPORATION,  
AND THE SAME HAS NOT BEEN  
REVOKED OR RESCINDED.

\_\_\_\_\_  
**SECRETARY-TREASURER**

\_\_\_\_\_  
**DATE**

**CLEARY & I-10 SOUTH**  
**WASTEWATER PUMPING EQUIPMENT**

**PART 1 - GENERAL**

## 1.01 SCOPE OF WORK

- A. Furnish three (3) new submersible pumps and appurtenances complete including but not limited to (3) heavy duty, wastewater pumps, motors, hatch covers, base elbows, guide rails, and other auxiliary equipment and materials as specified herein and as required.

## 1.02 DESCRIPTION OF SYSTEMS

- A. The bid shall include: three (3) Hydromatic model S8LX4000FB, 40HP, 1150 RPM Max. explosion proof submersible pump units, three (3) 3/8" 316 SS pump lifting cables, three (3) 8" pump discharge elbows and sealing flanges, six (6) 2" x 20' SS scd 40 pump guide rails, three (3) Aluminum hatches 300#/sq ft loading and a 30" x 48" min clear opening, three (3) SS pump cable holder brackets and other equipment as specified herein.
- B. All the equipment specified herein is intended to be standard equipment for pumping all material in normal domestic wastewater. All equipment specified shall be offered by factory authorized agents for the brands supplied. Each pump shall produce 950 GPM @ 65' TDH with 62% min Eff at 1150 RPM max with a min shut off head of 87'. The pump shall also be able to produce 3150 GPM at 33' with 71% min eff as the secondary condition of service. The pump must be able to pass a 4" minimum spherical solid.

## 1.03 QUALIFICATIONS

- A. The supplier and manufacturers shall assume responsibility for the satisfactory operation of the pumping system including pumps, motors and other auxiliary equipment and materials as specified.
- B. The pumps covered by these Specifications are to be new and intended to be standard pumping equipment of proven ability as manufactured by a manufacturer having a minimum of five (5) years experience in the production of such pumps. The pumps furnished shall be designed, constructed and installed in accordance with the best practice and methods, and shall operate satisfactorily when installed. Pumps shall be manufactured in accordance with the Hydraulic Institute Standards.
- C. The pump manufacturer shall have, within a 2 hour drive of the job site, an authorized warranty center, fully staffed with factory trained mechanics, and equipped with a stock of all necessary spare parts for each model of pump furnished in this contract.
- D. All equipment furnished under this Specification shall be new and unused, shall be the standard product of manufacturers having a successful record of manufacturing and servicing the equipment and systems specified herein for a minimum of five (5) years.

- E. The submersible pumps shall be as manufactured by Hydromatic Pump Co. or owner approved Equal.

#### 1.04 SUBMITTALS

- A. Submittals shall include the following at a minimum:
  1. Complete system layout and erection drawings showing all details of construction, including dimensions and anchor bolt locations.
  2. Materials of construction list for all system components.
  3. Descriptive literature, bulletins, and/or catalogs of the equipment.
  4. Data on the characteristics and performance of each size pump. Data shall include guaranteed performance curves, based on actual shop tests of duplicate units, which show that they meet the specified requirements for head, capacity, efficiency, and horsepower. Factory certified curves shall be submitted on 8 1/2-inch by 11 -inch sheets. Curves shall be plotted from zero flow at shut off head to pump capacity at minimum specified total dynamic head.
  5. The total weight of the equipment including the weight of the single largest item.
  6. A complete total bill of materials for all equipment.
  7. A list of the manufacturer's recommended spare parts. Include gaskets, packing, etc. on the list. List bearings by the bearing manufacturer's numbers.
  8. Complete data on the motor.

#### 1.05 OPERATING INSTRUCTIONS

- A. Copies of an operating and maintenance manual for the pumps, motors shall be furnished to the owner. The manuals shall be prepared specifically for this installation and shall include all required catalog cuts, drawings, equipment lists, descriptions, etc. that are required to instruct operating and maintenance personnel unfamiliar with such equipment.

### **PART 2 - PRODUCTS**

#### 2.01 MATERIALS AND EQUIPMENT

- A. All parts shall be so designed and proportioned as to have adequate strength and stiffness and to be especially adapted for the work to be done.
- B. Stainless steel nameplates giving the name of the manufacturer, the rated capacity, head, speed, serial number, model number, horsepower, voltage, amperes and all other pertinent data shall be attached to each pump. A stainless

steel nameplate must be on the pump motor stating acceptance for Class I Groups C & D Explosion-Proof with a UL or FM approval.

- C. The nameplate ratings for the motors shall not be exceeded, nor shall the design service factor be reduced when its pump is operating at any point on its characteristic curve at maximum speed.

## 2.02 SUBMERSIBLE PUMPS

- A. The vendor shall furnish three (3) submersible Hydromatic non-clog wastewater pumps with a submersible electric motor connected for operation on 480/3/60 power with 35' power and sensor cords. The power cable shall be sized according to NEC and ICEA standards. Each pump shall be supplied with an 8" mating cast iron rail system discharge connection.
- B. Pumps shall be capable of handling raw, unscreened sewage. The design shall be such that pumping units will be automatically connected to the discharge piping when lowered into place on the discharge connection. The pumps shall be easily removable for inspection or service, requiring no bolts, nuts or other fastenings to be removed for this purpose, and no need for personnel to enter pump well.
- C. A sliding guide bracket consisting of two 304 stainless steel rails shall be an integral part of the pumping unit and the pump casing shall have a machined connecting flange to connect with the cast iron discharge connection, which shall be bolted to the floor of the sump and so designed as to receive the pump connecting flange without the need of any bolts or nuts.
- D. Sealing of the pumping unit to the discharge connection shall be accomplished by a simple linear downward motion of the pump with the entire weight of the pumping unit guided to and pressing tightly against the discharge connection; no portion of the pump shall bear directly on the floor of the sump and no rotary motion of the pump shall be required for sealing.
- E. Each pump shall be automatically and firmly connected to the discharge connection, guided by no less than two 304 stainless steel guide rails extending from the top of the station to the discharge connection. Sealing of the pumping unit to the discharge connection shall be accomplished by a machined metal-to-metal watertight contact. Sealing of the discharge interface with a diaphragm, O-ring or profile gasket will not be acceptable.
- F. Major pump components shall be of grey cast iron, ASTM A-48, Class 30, with smooth surfaces devoid of blow holes or other irregularities. All exposed nuts or bolts shall be AISI type 304 stainless steel.
- G. Sealing design shall incorporate metal-to-metal contact between machined surfaces. Critical mating surfaces where watertight sealing is required shall be

- machined and fitted with buna-n rubber O-rings. Fittings will be the result of controlled compression of rubber O-rings in two planes and O-ring contact of four sides without the requirement of a specific torque limit.
- H. Rectangular cross sectioned gaskets requiring specific torque limits to achieve compression shall not be considered as adequate or equal. No secondary sealing compounds, elliptical O-rings, grease or other devices shall be used.
  - I. Motors shall be designed such that they are sufficiently cooled by the surrounding environment or pumped media without the use of a water jacket.
  - J. The cable entry seal design shall preclude specific torque requirements to insure a watertight and submersible seal. The cable entry shall consist of a single cylindrical elastomer grommet, flanked by washers, all having a close tolerance fit against the cable outside diameter and the entry inside diameter and compressed by the body containing a strain relief function along with a primary epoxy barrier. The assembly shall provide ease of changing the cable when necessary. The cable entry junction chamber and motor shall be separated by a second epoxy barrier, which shall isolate the interior from foreign material gaining access through the pump top.
  - K. The pump motor shall be induction type with a squirrel-cage rotor, shell type design, housed in an oil-filled watertight chamber, NEMA B type. The stator windings and stator leads shall be insulated with moisture resistant Class H insulation rated for 356°F (180°C). The motor shall be inverter duty rated in accordance with the NEMA MG1, Part 31. The stator shall be slip-fit into the cast iron stator housing. The motor shall be designed for continuous duty handling pumped media of 104° F (40°C) and capable of up to 20 starts per hour.
  - L. The rotor bars and short circuit rings shall be made of cast aluminum. Thermal switches set to open at 260°F (125°C) shall be embedded in the stator lead coils to monitor the temperature of each phase winding. These thermal switches shall be used in conjunction with and supplemental to external motor overload protection and shall be connected to the control panel.
  - M. The junction chamber containing wire connectors shall be hermetically sealed from the motor by an epoxy barrier seal. Connection between the cable conductors and stator leads shall be made with threaded wire nuts.
  - N. The combined service factor (combined effect of voltage, frequency and specific gravity) shall be a minimum of 1.20. The motor shall have a voltage tolerance of plus or minus 10%. The motor shall be designed for operation up to 104°F (40°C) ambient and with a temperature rise not to exceed 176°F (80°C). A

performance chart shall be provided showing curves for torque, current, power factor, input/output kW and efficiency. This chart shall also include data on starting and no-load characteristics.

- O. The power cable shall be sized according to the NEC and ICEA standards and shall be of sufficient length to reach the junction box without the need of any splices. The outer jacket of the cable shall be water-proof. The motor and cable shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 65 feet.
- P. The motor horsepower shall be adequate so that the pump is non-overloading throughout the entire pump performance curve from shut-off through run-out. Required motor horsepower shall not exceed the horsepower as shown on the drawings. The pump head curve shall slope in one direction (always negative slope) with no points of inflection capable of causing hunting at the pump operation speed.
- Q. The pump shaft shall rotate on two bearings. Motor bearings shall be oil lubricated. The calculated L10 bearing life rating shall be 50,000 hours minimum. The upper and lower bearings shall be single deep groove ball bearings.
- R. Each pump shall be provided with a tandem mechanical shaft seal system consisting of two totally independent seal assemblies. The seals shall operate in an oil reservoir that hydro-dynamically lubricates the lapped seal faces at a constant rate. The upper and lower seal shall contain one stationary silicone carbide or ceramic seal ring and one rotating carbon seal ring. Each seal interface shall be held in contact by its own spring system. The seals shall require neither maintenance nor adjustment nor depend on direction of rotation for sealing. The position of both mechanical seals shall depend on the shaft.
- S. Each pump shall be provided with an oil chamber for the shaft sealing system. The oil chamber shall be designed to prevent overfilling and to provide oil expansion capacity. The drain and inspection plug, with positive anti-leak seal shall be easily accessible from the outside. The seal system shall not rely upon the pumped media for lubrication. The motor shall be able to operate dry without damage while pumping under load.
- T. Pump and motor shaft shall be the same unit. The pump shaft is an extension of the motor shaft. The pump shaft shall be AISI type 420 stainless steel.
- U. A wear ring system shall be used to provide efficient sealing between the volute and suction inlet of the impeller. Each pump shall be equipped with a brass, or stainless steel ring insert that is fitted to the volute inlet.

- V. Pump volute shall be single-piece grey cast iron, Class 30, non-concentric design with smooth passages large enough to pass any solids that may enter the impeller.
- W. The pump system including the pump, motor and power cable shall be explosion proof, and shall be approved for use in areas classified as hazardous locations in accordance with the NEC Class 1, Div. 1, Group C and D service as determined and approved by a U.S. nationally recognized testing laboratory (U.L., FM, CSA) at the time of the bidding of the project. As required by Factory Mutual (FM) the motor shall be capable of operating in pumped media up to 104°F. Motor thermal switches shall monitor and protect the motor from excessive temperature. An internal seal probe shall be provided, in the motor chamber.

### 2.03 MOTORS

- A. Pump motor shall be of the submersible type. Pump motors shall be three phase 460 volt. Separate pump motor and sensor cable shall be furnished for each pump. Control conductors shall be included in the cable for the winding temperature and seal failure sensors wherever possible.
- B. The stator, rotor and bearings shall be mounted in a sealed submersible type housing. The stator windings shall have Class H Insulation. Motor shall be designed for twelve starts per hour maximum.
- C. The pump and motor shall be specifically designed so that they may be operated partially dry or completely submerged in the liquid being pumped.
- D. Pump shall be equipped with heat sensors for failure detection. The heat sensors shall be a low resistance, bi-metal disc that is temperature sensitive. They shall be mounted directly in the stator and sized to open at 120°C or 130°C and automatically reset at 30 - 35°C differential. The sensor shall be connected in series with the motor starter coil so that the starter is tripped if a heat sensor opens. The motor starter shall be equipped with overload heaters so all normal overloads are protected by external heater block.

### 2.04 BEARINGS AND SHAFT

- A. An upper radial bearing and a lower thrust bearing shall be required. Bearings which require scheduled lubrication shall not be acceptable.
- B. The shaft shall have a tapered impeller fit and be machined from a minimum solid 420 stainless steel and be a design which is of large diameter with minimum overhang to reduce shaft deflection and prolong bearing life.
- C. Bearings shall have a minimum L-10 life of 50,000 hours.

### 2.05 RAIL SYSTEM

The lift station shall have a pump removal system including upper and lower guide rail supports with type 316 stainless steel cables. 304 stainless steel guide rails (minimum 2" dia.) shall be provided for easy removal and reconnection of pump units.

#### 2.06 ACCESS FRAMES AND CABLE HOLDERS

- A. Provide six (6) lockable 300#/sf ft aluminum pump/valve access hatches with stainless steel hardware and frames. Access hatch shall be supplied with the pumps and appurtenances and allow ample clearance for pump/valve removal.
- B. Stainless steel cable holders shall be provided with each pump fabricated from type 304 stainless steel plate. Sharp corners and edges shall be ground smooth to prevent abrasion and cutting of electrical cable insulation. The cable holder shall be of sufficient length and strength to provide support for each separate cable.

END OF SECTION